

travel great distances to reach the demand centers (cities and towns). Lastly, multiple wind turbines generate noise.<sup>52</sup> The loud roaring of a field of turbines adds to the difficult siting process.

Nevertheless, as wind technology continues to evolve, it will become a larger contributor to the energy generation process in the country.<sup>53</sup>

### **Renewable Energy for South Carolina**

South Carolina is located in the southeastern United States and has a population of 4,147,152 citizens.<sup>54</sup> It's primarily a rural state with 133.2 persons per sq mile.<sup>54</sup> As mentioned earlier in this paper, South Carolina is well behind the national average for utilizing renewable energy sources.<sup>5</sup> Given South Carolina maintains 37 active municipal landfills, bioenergy from municipal landfills is an attractive renewable energy source for the state.<sup>55</sup> Solar energy and wind energy are less attractive. Also, South Carolina has approximately 400 dairy farms the could be used as renewable energy sources.<sup>56</sup> Additionally, South Carolina maintains over 12 million acres of forestland that can support co-firing applications.<sup>57</sup>

As discussed above, solar technology is an option that is feasible but less attractive than bioenergy. This situation is due primarily to the fact that South Carolina is not geographically located in a region highly favored for sunlight.<sup>34</sup> As shown in Figure 7, the western states are more suitable for solar energy because of a greater available sunlight resource.<sup>34</sup> The additional concerns of intermittent power supply and cost issues also reduce the attractiveness of solar energy.<sup>41</sup>

Also, as discussed above, wind energy is a less attractive alternative because of its geographic location.<sup>47</sup> As Figure 12 shows, the southeast has very little wind resource available for generating electricity.<sup>47</sup> Also, the additional concerns of initial capital investment, siting issues, and noise pollution diminish wind energy as a viable renewable energy option for South Carolina.<sup>52</sup>

Therefore, bioenergy offers the best opportunity for South Carolina to increase its use of renewable energy. South Carolina should, first, increase its use of landfill gas to generate GreenPower. Also, but to a much lesser extent, South Carolina should pursue using animal waste from agricultural sites to supplement its bioenergy sources. Finally, South Carolina should explore the availability of forest sites to harvest wood chips for co-firing applications.

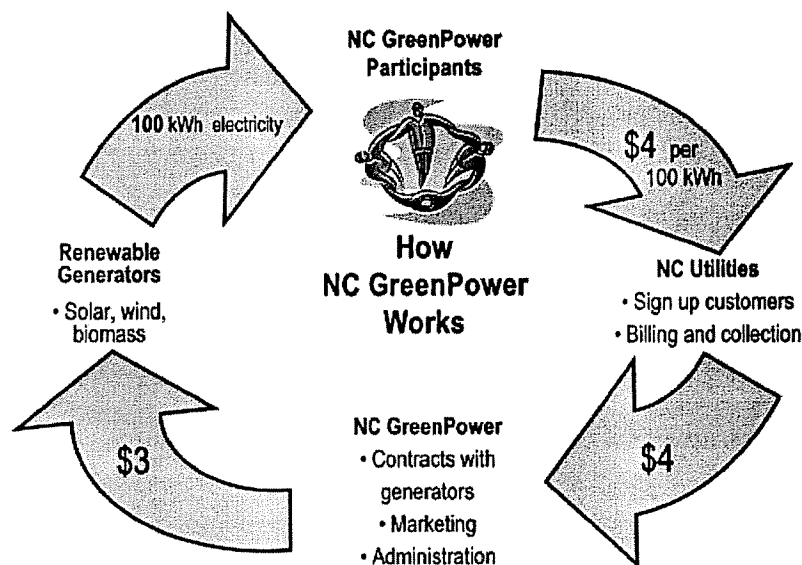
### **North Carolina GreenPower**

The North Carolina GreenPower program was developed at the request of the North Carolina Utilities Commission.<sup>2</sup> “It is an independent non-profit organization dedicated to improve North Carolina’s environment through voluntary contributions toward renewable energy.”<sup>2</sup>

For only \$4 a month, a citizen can purchase a block of 100 kilo-watt hours of GreenPower produced in North Carolina.<sup>2</sup> It is important to note that the consumer will not receive directly the 100 kilo-watt hours of renewable power.<sup>58</sup> The purchase of a block of renewable power equates to a promise from the utility to produce 100 kilo-watt hours of renewable energy on the customer’s behalf and place it on the electric utility grid for all North

Carolínians to use.<sup>58</sup> The North Carolina GreenPower program notes that purchasing one block of GreenPower for 12 months equates to planting 192 trees or not driving or 3,039 miles!<sup>59</sup>

All monetary contributions from North Carolina GreenPower consumers are channeled through an independent non-profit organization, Advanced Energy, which creates economic and environmental benefits through innovative approaches to energy.<sup>60</sup> Advanced Energy administers the North Carolina GreenPower program.<sup>2</sup> The writer interviewed Dr. Robert K. Koger, President and Executive Director, of Advanced Energy.<sup>61</sup> The writer discussed the North Carolina GreenPower program in detail with Dr. Koger. Dr. Koger stated that as a non-profit organization, all contributions are tax-deductible.<sup>61</sup> This characteristic has been the catalyst to



<sup>59</sup>Figure 14

the success of the program.<sup>61</sup> Figure 14 demonstrates the cycle of the North Carolina GreenPower program.<sup>59</sup> As illustrated above, the North Carolina GreenPower process is simple. According to Dr. Koger, the process is implemented fully and interested customers merely check

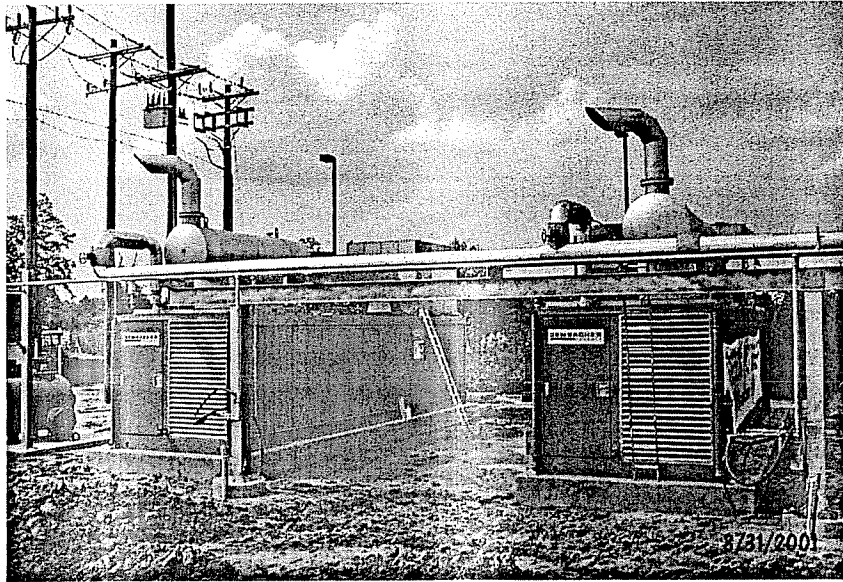
a box on their bill denoting that they would like to make a contribution to the renewable energy program.<sup>61</sup> Currently, two of the major investor-owned utilities in South Carolina also operate in North Carolina and actively participate in the North Carolina GreenPower program.<sup>61</sup> Therefore, it would simply require these utilities to expand their North Carolina GreenPower program and offer it to its South Carolina customers.<sup>61</sup> He believes that it would be advantageous for all utilities in North and South Carolina to combine their resources and create a joint endeavor between the two states.<sup>61</sup> He commented that “GreenPower of the Carolinas” is a tangible goal.<sup>61</sup>

The writer has discussed this approach with the two major investor owned utilities, Duke Power and Progress Energy, which have North and South Carolina customers.<sup>62, 63</sup> Both utilities were receptive to this approach.<sup>62, 63</sup> The writer also discussed this approach with the in-state investor owned utilities, Lockhart Power and the South Carolina Electric and Gas Company.<sup>64, 65</sup> These two companies also are interested in discussing GreenPower in an open forum with stakeholders.<sup>64, 65</sup>

### **Santee Cooper GreenPower**

Santee Cooper is a state-owned electric utility serving approximately 140,000 customers.<sup>66</sup> It has a smaller retail customer base than the other utilities in the state, but it also provides the power needs to all 20 electric cooperatives and other municipalities and industries.<sup>66</sup> These additional indirect customers boost their service population to approximately 625,000 customers statewide.<sup>66</sup> This additional customer base also expands Santee Cooper’s GreenPower audience.

Currently, Santee Cooper operates two GreenPower plants. They are located at the Lee County Landfill and the Horry County Landfill.<sup>3</sup> They produce 5.4 and 3.3 megawatts of power, respectively.<sup>3</sup> Therefore, each plant would produce approximately 21,000 (100 kilowatt hour) blocks per month, enough power to supply approximately 14,000 homes.<sup>3</sup>



<sup>3</sup>Figure 15

Figure 15 shows the Santee Cooper Palmetto Landfill GreenPower power plant. Santee Cooper presents an admirable representation of South Carolina's utility industry. Santee Cooper's pursuit of innovative technology to produce clean, environmentally friendly electricity from renewable energy sources is commendable.

The writer conducted a telephone interview with Mr. J.D. Steedly, Director of Program Development for Santee Cooper.<sup>67</sup> Mr. Steedly mentioned that Santee Cooper is also constructing similar plants at the Lee County Landfill, the Anderson County Landfill, and the Richland County Landfill.<sup>67</sup> He also commented that Santee Cooper is in the process of

installing additional units at other landfills and should be able to provide up to 18 MW of renewable energy.<sup>67</sup> Mr. Steedly said that Santee Cooper recognizes that 18 MW of generation will produce an excess in renewable energy and is willing to consider offering the excess power to North and South Carolina utilities.<sup>67</sup> He stated that their GreenPower program started as a retail marketing program targeting the customer base in the Myrtle Beach area.<sup>67</sup> The program used the North Carolina GreenPower program as a model.<sup>67</sup> Their preliminary customer-based research revealed that there was adequate residential and commercial interest in the GreenPower program.<sup>67</sup> The survey feedback showed that the consumer base was willing to support a monthly block purchase program priced between three and five dollars.<sup>67</sup> To ensure the early success of the program, Santee Cooper adopted an aggressive outreach program and solicited long-term commercial partners to help launch the program.<sup>67</sup>

Santee Cooper recognized the increasing number portfolio mandates being required nationwide.<sup>67</sup> This observation prompted Santee Cooper to take the initiative. Mr. Steedly stated that it was important to ensure that all renewable energy purchased by customers would be generated in South Carolina.<sup>67</sup> He also stated that Santee Cooper does not retain any GreenPower funds.<sup>67</sup> 100% of the revenue generated by their GreenPower program is returned to the program and applied toward developing additional means of producing renewable energy.<sup>67</sup> Mr. Steedly stated that the success of the program hinges on management's commitment to protect the environment.<sup>67</sup> Also, the company's philosophy is to allow environmentally conscious consumers the opportunity to have a role in protecting environment.<sup>67</sup> Mr. Steedly discussed the positive public relations impact the program has had for commercial and residential customers.<sup>67</sup> The interest and participation in the Santee Cooper GreenPower program is self-perpetuating.

## South Carolina Energy Office

In 1992, the South Carolina Energy Conservation and Efficiency Act<sup>68</sup> was passed and created the South Carolina Energy Office. The Office is a part of the Division of Insurance and Grants Administration within the Budget and Control Board.<sup>68</sup> The “primary purpose of the South Carolina Energy Office is to develop and implement a well-balanced energy strategy and to increase the efficient use of all energy sources throughout South Carolina.”<sup>69</sup>

The writer conducted a face-to-face interview with Dr. John Clark, Director of the South Carolina Energy Office.<sup>70</sup> The purpose of the interview was to discuss implementing a statewide GreenPower program. Dr. Clark remarked that the Santee Cooper GreenPower program is somewhat unique because it is a “non-profit” state owned utility and not regulated by the South Carolina Public Service Commission.<sup>70</sup> The Public Service Commission has broad jurisdiction over matters pertaining to the investor owned electric in South Carolina.<sup>71</sup> Santee Cooper’s status as an unregulated utility lends it more flexibility in initiating and implementing new programs.<sup>70</sup> Dr. Clark believes there was an internal initiative within Santee Cooper to incorporate GreenPower into their energy generating practices.<sup>70</sup> As for the investor-owned utilities in South Carolina, they have not actively pursued GreenPower programs in South Carolina.<sup>70</sup> Dr. Clark attributed this situation to the fact that the South Carolina Public Service Commission has not encouraged investor-owned utilities to pursue GreenPower.<sup>70</sup> Conversely, Dr. Clark also commented that he does not believe that the South Carolina Public Service Commission has discouraged the South Carolina investor-owned utilities from considering GreenPower options.<sup>70</sup> In short, the lack of a “push” via a portfolio mandate, environmental action groups, or an Order from the South Carolina Public Service Commission has slowed

progress toward a statewide GreenPower program.<sup>70</sup> Dr. Clark mentioned that Santee Cooper took a proactive approach to hedge any portfolio mandate and that the company also maintains a genuine desire to be good environmental stewards.<sup>70</sup>

Dr. Clark discussed alternate renewable energy sources that may be feasible for South Carolina. He mentioned that, in general, renewable energy is more expensive than conventional methods.<sup>70</sup> He also mentioned that solar and wind power are not very good options for South Carolina.<sup>70</sup> He elaborated on the current joint effort with Santee Cooper to use wood chips in co-firing applications.<sup>70</sup> He also commented that certifying biomass wood chips as GreenPower will be more difficult because environmentalists argue that co-firing is not a “green” process.<sup>70</sup> However, Dr. Clark was optimistic about a joint project with Clemson University on using animal waste methane to produce electricity.<sup>70</sup> This process would be very similar to the already acceptable methane captured and processed for bioenergy at municipal landfills.<sup>70</sup>

Dr. Clark also discussed the benefits of “net-metering” for customers that decided to install an onsite stand-alone renewable energy process.<sup>70</sup> This approach effectively would let the customer be charged for only their net consumption of electricity.<sup>70</sup> He also discussed the need for utilities to address the costs to interconnect to the electric utility grid.<sup>70</sup> Dr. Clark commented that the consumer should be responsible for the cost to install “green” equipment and not fully absorb the cost to interconnect.<sup>70</sup>

Dr. Clark elaborated on the appropriate approach to implementing a statewide program. He noted that the South Carolina Code of Laws Section 48-52-210(B)(4)<sup>72</sup> charges the South Carolina Energy Office to “Encourage the development and use of indigenous, renewable energy resources.”<sup>72</sup> Hence, the South Carolina Energy Office certainly has a key roll in establishing a GreenPower program. However, he believes that it would be more appropriate for the Office of



Regulatory Staff, and not the South Carolina Energy Office, to present a GreenPower proposal before the South Carolina Public Service Commission.<sup>70</sup> The Office of Regulatory Staff represents the public's interest in utility matters.<sup>73</sup>

Dr. Clark believes there is an adequate interest in South Carolina to support a statewide GreenPower initiative.<sup>70</sup> Dr. Clark concluded the interview by suggesting that the restructuring of the South Carolina Public Service Commission may provide the ideal climate ideal for acceptance of a statewide GreenPower program in South Carolina.<sup>70</sup>

### **South Carolina Office of Regulatory Staff**

The South Carolina Office of Regulatory Staff represents the public interest in utility regulation by balancing the concerns of the using and consuming public, the financial integrity of public utilities, and the economic development of South Carolina.<sup>73</sup> The Office of Regulatory Staff was created in February 2004 with the Governor's signature of Senate Bill 208.<sup>73</sup> The South Carolina Office of Regulatory Staff is very interested in establishing a statewide GreenPower program in South Carolina.<sup>74</sup> The writer has been investigating the current condition of GreenPower in the South Carolina and evaluating potential renewable energy options for South Carolina. The South Carolina Office of Regulatory Staff would be instrumental in developing a GreenPower program in South Carolina.<sup>74</sup> It would be responsible for providing support to the South Carolina Energy Office. It also would be responsible for preparing a formal proposal for South Carolina GreenPower.<sup>74</sup> The South Carolina Office of Regulatory Staff will also present the proposal before the South Carolina Public Service Commission.

## **GreenPower for South Carolina Proposal**

Renewable energy sources, e.g., sun, wind, biomass, etc., are self-replenishing, and therefore cannot be depleted. Given the environmentally conscious society of today, it is more than timely for South Carolina to establish a voluntary statewide renewable energy program.<sup>74</sup> Georgia and North Carolina have well established GreenPower programs.<sup>75, 2</sup>

South Carolina currently provides electricity to its customers via four investor-owned utilities (Duke Power, Lockhart Power, Progress Energy, and South Carolina Electric and Gas Company), twenty-one municipalities, one state-owned utility (Santee Cooper), and twenty electric cooperatives. The investor-owned utilities are regulated by the South Carolina Public Service Commission and primarily are captured by this proposal.<sup>71</sup> However, Santee Cooper, a state-owned, unregulated electric utility, has taken the initiative to develop its GreenPower program.<sup>3</sup> Duke Power and Progress Energy currently participate in the North Carolina GreenPower program.<sup>76, 77</sup> Lockhart Power and the South Carolina Electric and Gas Company are willing to consider becoming partners in a statewide GreenPower program.<sup>64, 65</sup>

Three options detailing the structure of a statewide GreenPower program are presented below:

### ***Option I***

Option I considers establishing separate and distinct programs. Duke Power and Progress Energy simply would expand their North Carolina GreenPower program into South Carolina. Advanced Energy would continue to administer the program, and merely would add South Carolina's Duke Power and Progress Energy customers. Lockhart Power and the South Carolina

Electric and Gas company would establish in-house programs working closely with the South Carolina Energy Office. Lockhart Power and the South Carolina Electric and Gas Company may elect to partner with Santee Cooper to form a joint GreenPower program. This option offers an avenue for all utilities to offer GreenPower to South Carolinians. However, this structure creates a very fragmented approach to a uniform goal.

### ***Option II***

Option II considers establishing a program unique to South Carolina. Under this approach, all GreenPower sources would be located in South Carolina. All investor-owned utilities, working closely with the South Carolina Energy Office, would develop in-house programs. Also, the utilities may elect to partner with Santee Cooper to form a joint GreenPower program. Although this option ensures South Carolinas received GreenPower produced in South Carolina and provides a uniform approach, it does not take advantage of the success of the North Carolina GreenPower program. It also overlooks the renewable energy resources available in North Carolina.

### ***Option III***

Option III considers a collaborative effort between South Carolina and North Carolina: “GreenPower of the Carolinas.” Duke Power, Lockhart Power, Progress Energy, South Carolina Electric and Gas Company, and Santee Cooper join the North Carolina GreenPower Program administrated by Advanced Energy. The South Carolina Energy Office would provide

administrative support as needed. This joint program would take advantage of established, successful programs as well as utilize renewable energy sources in both states. Also, adopting an independent non-profit organization to administer the program offers an added benefit. That is, this option limits government interactions in a “for-profit” arena. Given that Santee Cooper is an unregulated utility with an established GreenPower program, it may elect to retain its program separately. This option offers the best approach for success. A collaborative effort between sister states working together to better the environment is a win-win opportunity.

“GreenPower of the Carolinas” would be a giant step forward for southeastern utilities. GreenPower of the Carolinas would obviously serve as a model for other utilities nationwide. The Office of Regulatory Staff asks that each utility consider the options presented above and provide feedback and comments. Please know that the Office of Regulatory Staff is open to considering alternate options not presented in this proposal.

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<sup>74</sup>The writer is a member of the South Carolina Office of Regulatory Staff. The writer is employed in the Electric and Gas Department which regulates investor owned electric utilities in South Carolina.

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<http://www.southerncompany.com/gapower/green/home.asp?mnuOpco=gpc&mnuType=sub&mnuItem=ps>

<sup>76</sup>Duke Power Company: NC GreenPower

<http://www.dukepower.com/forbusiness/small/products/ncgreen.asp?promo=1>

<sup>77</sup>Progress Energy: NC GreenPower

<http://www.progress-energy.com/custservice/carres/greenpower/index.asp>